

ABSTRACT

FEATURE SIZE REDUCTION IN THIN FILM MAGNETIC WRITE HEAD USING LOW TEMPERATURE DEPOSITION COATING OF PHOTOLITHOGRAPHICALLY-DEFINED TRENCHES

5 A method for reducing feature size in a thin film magnetic write head using low
temperature deposition coating of photolithographically-defined trenches. According to the
method, a plating seed layer is applied over a selected base layer and a photoresist layer is spun
onto the seed layer to a desired thickness. A trench is defined in the photoresist layer to initiate
the formation of a stencil for the pole piece. The trench is deep enough to expose the plating
10 seed layer, and has substantially vertical side walls. An insulative spacer layer is deposited to
cover the trench side walls using a low temperature chemical vapor deposition process.
15 Horizontal portions of the spacer layer are anisotropically etched to remove spacer layer material
from the bottom of the trench and thereby expose the plating seed layer, while leaving intact
vertical portions of the spacer layer that cover the trench side walls. This process defines a
narrowed trench that is reduced in horizontal size according to approximately twice the thickness
of the spacer layer on the trench side walls. A structure of reduced feature size is formed by
electroplating metallic material into the narrowed trench. The photoresist layer and the spacer
layer vertical portions are then stripped away, and the plating seed layer is milled or sputter
etched to leave a structure of reduced feature size.